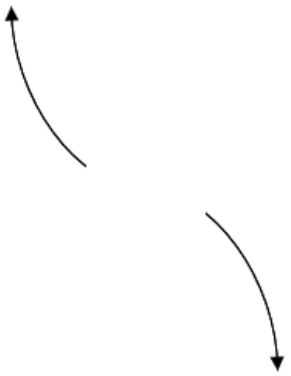
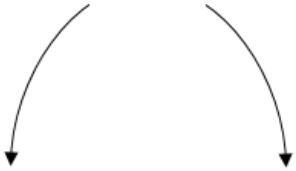
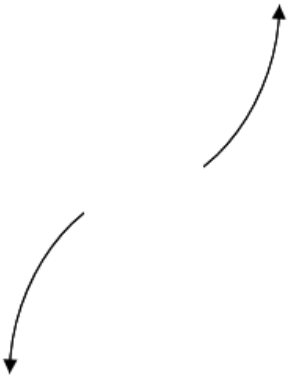
1. Describe the end behavior of the polynomial below.

$$f(x) = 4(x+3)^4(x-3)^9(x+2)^4(x-2)^6$$

A. 

B. 

C. 

D. 

E. None of the above.

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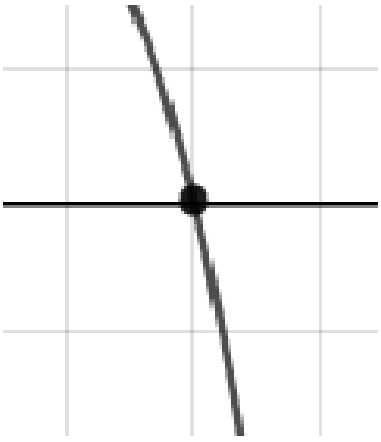
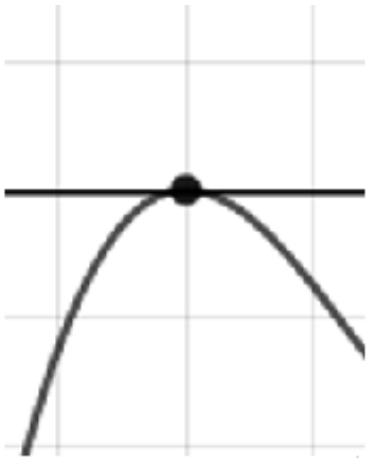
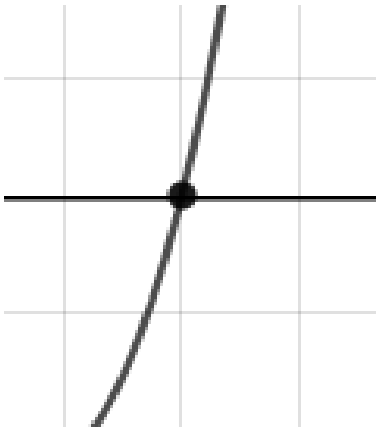
2. Describe the zero behavior of the zero $x = -8$ of the polynomial below.

$$f(x) = -3(x+9)^6(x-9)^5(x+8)^{14}(x-8)^9$$

A. 

B. 

C. 

D. 

E. None of the above.

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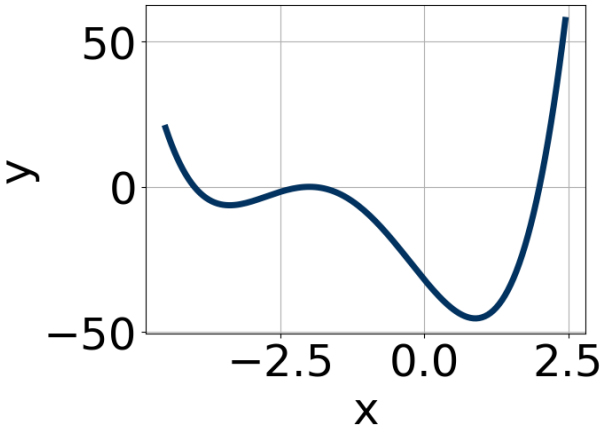
3. Which of the following equations *could* be of the graph presented below?



A. $17(x+2)^{10}(x-2)^{7}(x+4)^{5}$

B. $-9(x+2)^{10}(x-2)^{9}(x+4)^{11}$

C. $-18(x+2)^{10}(x-2)^{11}(x+4)^{10}$

D. $8(x+2)^{7}(x-2)^{4}(x+4)^{5}$

E. $20(x+2)^{4}(x-2)^{4}(x+4)^{9}$

---

4. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in

the form $x^3 + bx^2 + cx + d$.

$$3 + 2i \text{ and } 4$$

A. $b \in [1, 8], c \in [-7.52, -6.31],$ and $d \in [11, 13]$

B. $b \in [5, 14], c \in [36.76, 37.91],$ and $d \in [49, 57]$

C. $b \in [-15, -7], c \in [36.76, 37.91],$ and $d \in [-52, -48]$

D. $b \in [1, 8], c \in [-6.57, -5.83],$ and $d \in [6, 9]$

E. None of the above.

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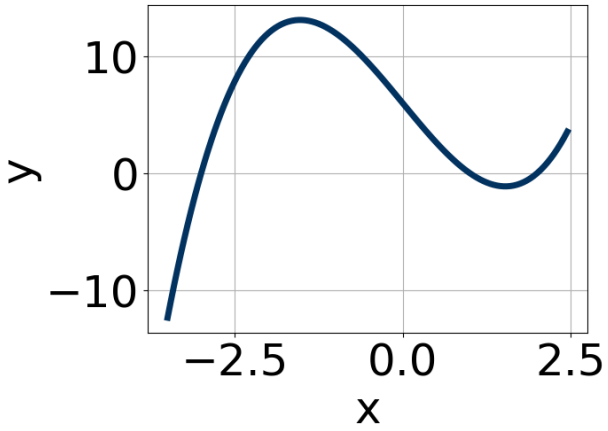
5. Which of the following equations *could* be of the graph presented below?



A. $4(x-2)^4(x+3)^6(x-1)^5$

B. $16(x-2)^5(x+3)^5(x-1)^5$

C. $-9(x-2)^{10}(x+3)^9(x-1)^7$

D. $4(x-2)^6(x+3)^7(x-1)^{11}$

E. $-10(x-2)^{11}(x+3)^5(x-1)^7$

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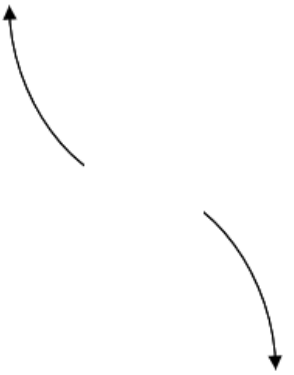
6. Describe the end behavior of the polynomial below.

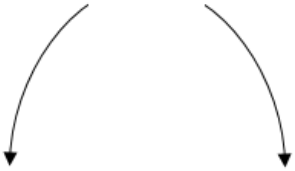
$$f(x) = -9(x+8)^4(x-8)^5(x-6)^4(x+6)^5$$

A.

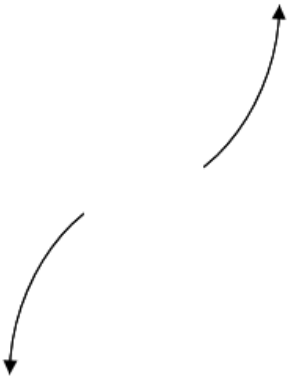


C.

B.



D.



E. None of the above.

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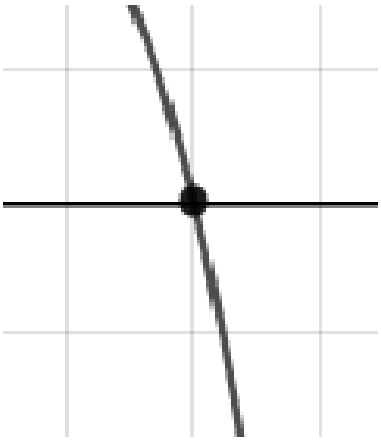
7. Describe the zero behavior of the zero $x = -5$ of the polynomial below.

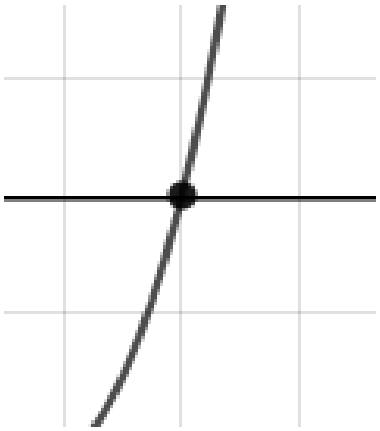
$$f(x) = -9(x-5)^4(x+5)^7(x-9)^4(x+9)^8$$

A.



B.

C. 

D. 

E. None of the above.

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8. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$1, \frac{-3}{4}, \text{ and } \frac{6}{5}$$

A. $a \in [20, 21], b \in [-35, -25], c \in [-9, 1],$ and $d \in [15, 24]$

B. $a \in [20, 21], b \in [-22, -14], c \in [-21, -16],$ and $d \in [15, 24]$

C. $a \in [20, 21], b \in [27, 36], c \in [-9, 1],$ and $d \in [-26, -17]$

D. $a \in [20, 21], b \in [-35, -25], c \in [-9, 1],$ and $d \in [-26, -17]$

E. $a \in [20, 21], b \in [10, 12], c \in [-33, -25],$ and $d \in [-26, -17]$

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9. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $x^3 + bx^2 + cx + d$.

$$3 + 4i \text{ and } 4$$

A. $b \in [-5, 7], c \in [-7.9, -4.2],$ and $d \in [11, 13]$

B. $b \in [-5, 7], c \in [-8.4, -7.9],$ and $d \in [13, 18]$

C. $b \in [7, 19], c \in [48.6, 51.5],$ and $d \in [98, 101]$

D. $b \in [-10, -4], c \in [48.6, 51.5],$ and $d \in [-102, -94]$

E. None of the above.

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10. Construct the lowest-degree polynomial given the zeros below. Then, choose the intervals that contain the coefficients of the polynomial in the form $ax^3 + bx^2 + cx + d$.

$$\frac{3}{4}, \frac{5}{2}, \text{ and } -4$$

A. $a \in [5, 9], b \in [16, 29], c \in [-71, -68],$ and $d \in [-63, -58]$

B. $a \in [5, 9], b \in [-13, -5], c \in [-95, -76],$ and $d \in [-63, -58]$

C. $a \in [5, 9], b \in [2, 9], c \in [-95, -76],$ and $d \in [55, 66]$

D. $a \in [5, 9], b \in [2, 9], c \in [-95, -76],$ and $d \in [-63, -58]$

E. $a \in [5, 9], b \in [57, 64], c \in [115, 125],$ and $d \in [55, 66]$
